



## **South Africa's Major Dust sources: risk to croplands**

Frank Eckardt (1), Nikolaus Kuhn (2), Jonathan Murray (3), and Anthony Palmer (4)

(1) Environmental and Geographical Science Department, University of Cape Town, South Africa (frank.eckardt@uct.ac.za), (2) Department of Environmental Sciences, Universitaet Basel, Basel, Switzerland (Nikolaus.Kuhn@unibas.ch), (3) Department of Physics, Imperial College, London, United Kingdom (j.murray@imperial.ac.uk), (4) Agricultural Research Council, Rhodes University, Grahamstown, South Africa (palmert@arc.agric.za)

A survey of Meteosat Second Generation (MSG) data covering the period of 2006-2017 for South Africa identifies the most persistent and major dust sources as grasslands and agricultural areas home to Luvisols and Arenosols in the Free State between Welkom and Bloemfontein. Dust emission is seasonal and peaks in the August to September period and may start in July and continue until January depending on the onset of the rainy season. Plumes may be triggered by both winter and summer synoptics. 2016 coincided with a drought and became the dustiest year in the observational record. During this time dust emissions were also noteworthy in the neighbouring Northern Cape, Mpumalanga and North West province. More than 80 dusty days were identified in MSG data with some of the 200 plumes being traceable as far as Gauteng and KwaZulu Natal. Relating identified events to preceding conditions and triggers is currently underway and forms part of the South African Cropland Dust Emission Risk project (SACDER), jointly funded by the Swiss National Science Foundation and the South African National Research Foundation. The predominantly anthropogenic source areas for South African dust are strikingly different when compared to neighbouring countries. According to previous satellite image surveys the southern African sub-continent is home to some of the world's major dust sources, hosting both the Etosha (Namibia) and Makgadikgadi Pans (Botswana). South Africa's large pans by contrast appear less emissive.